Cocycle invariants with quandles and symmetric doubles for oriented links

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Abstract. Quandle cocycle invariants are introduced for oriented (classical or surface) links and they are usefully applied for several studies of classical links and orientable surface-links. On the other hand, symmetric quandle cocycle invariants were introduced as a quandle invariant for all classical links and surface-links. However, by the construction of symmetric quandle homology groups and knot invariants, it is expected that the symmetric quandle invariants are weaker than the quandle invariants for oriented links. Is it ture? In this talk, we give the answer.